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1 April 1968

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MEMORANDUM FOR: Chief, Imagery Exploitation Group, NPIC

THROUGH: Chief, Scientific Division, IEG

SUBJECT: Trip Report on Visit to [REDACTED]

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1. On 20 March 1968 I visited the [REDACTED]

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We visited [REDACTED] who is in charge of the laboratory, and [REDACTED] who is conducting research, half of which NPIC is funding. The other half is being funded by ARPA. The research is being conducted in image enhancement techniques by use of a computer. The process is to scan a transparency with a photo-electric cell and record the image either on magnetic tape or on IBM cards. The tape or cards are then processed by a computer which is programmed to print out the image again, with whatever changes the operator indicates. The program is written to remove or correct the following abnormalities.

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- a. Defocus
- b. Image motion
- c. Grain
- d. Latent imagery due to contrast
- e. Edge gradient blur
- f. Atmospheric degradation

2. While we were present [REDACTED] put on a demonstration first of enhancing a latent image and second of correcting for defocus. The latent image enhancement was very impressive. Details in deep shadow under the wing of an aircraft were brought out in a way that was well beyond what could be done by photo lab manipulation. The correction of defocus was less successful because the amount of defocus was not known.

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3. This brings up a very important point. That is, if we know the amount of any of the abnormalities, from having first-hand knowledge of the camera and the conditions at the time of exposure, a much sharper image can be produced. This has many possibilities for the various KH programs.

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SUBJECT: Trip Report on Visit to [REDACTED]

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4. At present [REDACTED] is working with an image format 64 mm by 64 mm in size. However, he will be able to increase this to 100 mm on a side. He is also working on a memory bank which will cut down on computer time. Another improvement in development is the smoothing out of trace lines in the image produced by the computer.

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5. We feel that the computer enhancement process has a very promising future. It is not a system that would be used wholesale on large quantities of imagery but would be used only on images of very high priority. We recommend that NPIC continue the funding of this research and purchase the necessary equipment as soon as it becomes operational.

6. The balance of the trip is being reported in a joint effort signed by [REDACTED] a copy of which will be furnished to IEG.

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[REDACTED]
Chief, Nuclear/Industrial Branch, SD

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